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Gypsy Moth Manual

Control Section

Eradication Using Insecticides

Contents

Overview of Eradication Using Insecticides

Eradication by application of insecticides is often done because it will drastically reduce a gypsy moth population. After an initial reduction of a population, other techniques, such as mass trapping or repeated insecticide application, may be used.

This section contains information on (1) the materials needed and (2) the procedure for eradication using insecticides.

Materials Needed

The following materials are usually required for eradication:

- Insecticide(s) to be used
- Topographic maps (1:24,000) or other suitable map of larger scale
- Radios
- Prospectus and contract
- *Aerial Application Manual*
- Safety equipment
- Labels for insecticides being used
- Material Safety Data Sheets (MSDSs)
- Dye Cards (for monitoring spray deposits) or water-sensitive monitoring paper
- Kytoons, balloons, helium or other guidance technology (e.g., geopositioning systems equipment) for large spray blocks
- Balloons and helium for small spray blocks
- Communication equipment (radios and antennas)
- Wind meter

- Equipment to measure relative humidity (only if making ULV application)

Overview of the Procedures for Eradication Using Insecticides

The steps involved in eradication using insecticides are as follows:

Step 1—Notify Public of Spraying

Step 2—Notify Contractor to Report

Step 3—Calibrate and Check Spray Equipment

Step 4—Monitor Weather Conditions

Step 5—Begin Application

Step 6—Monitor Application and Weather

Step 7—Maintain Spray Block Map

Step 8—Conduct Posttreatment Survey

The following section will discuss these steps in detail.

Procedure for Eradication Using Insecticides

Step 1—Notify Public of Spraying

About 1 week before the actual spray day, notify the public, media, and appropriate law enforcement officials within the spray block. In some cases, it may only be possible to make these notifications 2 or 3 days before the treatment due to weather conditions and the desirability for exact application timing with the gypsy moths' biological development.

Step 2—Notify Contractor to Report

Notify contractor 5 to 7 days prior to anticipated starting date or as required by the contract.

Step 3—Check and Calibrate Spray Equipment

To check and calibrate the aircraft spray system, use the guidelines in **Appendix L**. Also check for leaks, dirt, and faulty equipment. If using nozzles, they should be new and made of stainless steel. Do not use brass nozzle tips. The end nozzle's location should be no more than

three-quarters of the wing span. If boom extends more than 6 inches beyond the end nozzle, the end nozzle should be fed from the end of the boom by use of a bleed-line.

See also **Appendix M** — Nozzle and Pressures

Step 4—Monitor Weather Conditions

NOTICE

Various weather will prevent or terminate the application of insecticides:

- When winds are above 10 miles per hour
- When high temperatures are above 80°F when either low volume (LV) or ultra low volume (ULV) sprays are planned
- When humidity is below 50%
- When rain is imminent
- When the insecticide is not properly settling

Weather plays an important part in aerial applications. Winds may cause spotty coverage within the target area. To reduce drift and to comply with the FEIS, apply insecticides only when winds are below 10 miles per hour.

High temperatures, combined with low humidity, may cause fine sprays, either low volume (LV) or ultra low volume (ULV), to evaporate or drift away without reaching the tree canopy. Apply insecticide only when temperatures are below 80 F. High temperatures can cause excessive evaporation of the insecticide suspension before it reaches the target. The amount of evaporation depends upon the type of insecticide being used. When temperatures rise, inversion layers may form in the air and prevent insecticide from depositing on the foliage.

Suspend application when humidity drops below 50 percent at ground level. At this time, humidity at release point above trees will be much lower and result in excessive evaporation.

Suspend application whenever rain is imminent. After rain, apply insecticides only when the target foliage has dried sufficiently. Follow the insecticide label for instructions on application before or after rainfall.

Suspend application whenever the insecticide is not properly settling in the target area. You can determine the insecticide settling pattern by monitoring dye cards.

The best weather for spraying is usually from dawn until mid-morning (4 a.m. to 10 a.m.). Atmospheric conditions are best for getting proper deposition in treatment areas at these times.

A simple indicator of time to quit is soil/air temperature difference. Take the soil temperature by placing the thermometer probe on an unshaded site. Shade the thermometer for 3 minutes before reading. Take the air temperature 5 feet above the surface in the open, but with the thermometer shaded. When soil temperature rises above air temperature, the spray pattern generally breaks up and the spray program should cease. If possible, monitor temperature and humidity at 30 to 50 feet above tops of target trees where aircraft is releasing spray.

Step 5—Begin Application

Do not apply insecticides when children are walking to school or waiting for school buses.

Begin spraying after the weather and aircraft have been checked and approved. Continue daily spray operations as long as weather conditions permit.

Step 6—Monitor Application and Weather

Monitor aerial applications by one of the following methods:

1. Observation aircraft flying behind the spray aircraft.
2. Ground observers and dye cards (or the water-sensitive monitoring paper) on the ground.

For large treatment blocks, use both methods for monitoring (observation aircraft *and* dye cards).

Observation Aircraft

Observation aircraft are only necessary for large treatments.

Ground Observers and Dye Cards

Follow the specific instructions that come with the dye cards or the water-sensitive monitoring paper. Use the monitoring paper to assess spray distribution, droplet density, and droplet size. Remember that the droplet size observed on water-sensitive cards is about twice as large as the actual droplet that is falling through the air. Refer to label or Otis Plant Methods Center Laboratory for proper droplet size.

If available, make use of a “Swath Kit” for characterization of aircraft and reading monitoring cards. With some materials, a dye must be used to allow the Swath Kit to read individual droplets.

Step 7—Maintain Spray Block Map

For large spray areas, maintain a Spray Block Map. Following each day of spraying, color all maps to show the treated areas. When making two or three applications (as with *Bacillus thuringiensis*), draw diagonal lines on the map to show progress of the first application and crosshatch for the second application. Indicate third application by shading the area with solid color. It is helpful to show on the map the number of gallons or pounds of insecticide applied in each block.

Step 8—Conduct Post-treatment Survey

Conduct a post-treatment survey of the treatment area by using the delimiting survey instructions. Use 16 to 36 traps per square mile. Follow the instructions covered under **Delimiting Survey** in the Survey Section of this manual.

If no moths are found, declare area eradicated. If a few single catches are made, you may want to use mass trapping or one more year of delimiting to see if an infestation remains over the winter. The following year you can either decide to retreat or declare area eradicated.